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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
NGUYEN, HUNG D	

ART UNIT	PAPER NUMBER
4118	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/516,721	NORRISH ET AL.	
	Examiner	Art Unit	
	HUNG NGUYEN	4118	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/2/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *30-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *30-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/04/05, 03/12/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to the amendment filed on 12/02/2004. As directed by the amendment: claims 1-29 have been cancelled and new claims 30-56 have been added. Thus, claims 30-56 are presently pending in this application.

Specification

2. The disclosure is objected to because of the following informalities: On page 11, line 9, "the work piece" is incorrectly referenced with the number 15; "the work piece" should be referenced with number 16.

Appropriate correction is required.

3. The disclosure is objected to because of the following informalities: On page 12, line 32, "its contact tip" is incorrectly referenced with the number 23; "Its contact tip" should be referenced with number 13.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 30-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeshi et al. (Japan 11-226734A).

5. Regarding claim 30, Takeshi et al. discloses a method of controlling a welding process having a plurality of welding cycles, comprising:

- Advancing a consumable electrode 2 (Fig. 1) towards a workpiece 5 (Fig. 1) (Par. 11); and
- Dynamically regulating a rate of advancement and an instantaneous melt rate of the consumable electrode during each of said plurality of welding cycle in response to a predetermined event occurring during the welding process (Par. 8 and 9).

6. Regarding claim 31, Takeshi et al. discloses the coordinating the instantaneous melt rate with the rate of advancement of the consumable electrode 2 (Fig. 1) (Par. 8 and 9).

7. Regarding claim 32, Takeshi et al. discloses the controlling a source of power 11 (Fig. 1) that is supplied to the consumable electrode 2 (Fig. 1) (Par. 10).

8. Regarding claim 33, Takeshi et al. discloses the source of power 11 (Fig. 1) produces a current waveform (Par. 1).

9. Regarding claim 34, Takeshi et al. discloses the monitoring a feedback signal associated with the welding process (Par. 13 and Abstract).

10. Regarding claim 44, Takeshi et al. discloses an arc welding system comprising:

- A power source 11 (Fig. 1), and
- A control unit 12 (Fig. 1) and means 10 (Fig. 1) for advancing a consumable electrode 2 (Fig. 1) towards a workpiece 5 (Fig. 1) during a welding process, the consumable electrode being energized by the power source 11 (Fig. 1) to cause the consumable electrode to supply molten material to the workpiece, where the means for advancing is control by the control unit 12 (Fig. 1) to dynamically

regulate of advance of the consumable electrode (Par. 8) in response to a predetermined event occurring during the welding process.

11. Regarding claim 45, Takeshi et al. discloses the power source 11 (Fig. 1) is controlled by the control unit 12 (Fig. 1) in response to the predetermined event to control an instantaneous melt rate of the consumable electrode (Par. 8 and 9).

12. Regarding claim 46, Takeshi et al. discloses the control unit 12 (Fig. 1) is adapted to coordinate the instantaneous melt rate with the rate of advancement for the consumable electrode (Par. 8).

13. Regarding claim 47, Takeshi et al. discloses a means 16 (Fig. 1) for obtaining a feedback signal associated with the welding process (Par.13 and Abstract).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. Claims 35-36 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. (Japan 11-226734A) in view of Fulmer et al. (US Pat. 6,498,321 B1).

16. Regarding claim 35-36 and 48-49, Takeshi et al. discloses all the claimed features except for the feedback signal employs a voltage and a current. Fulmer et al., however, teaches the voltage and current feedback to automatically adjust the arc

length and the rapid response time prevents any current overshoot (Col.2, Lines 14-24). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Takeshi et al. to include the voltage and current feedback, as taught by Fulmer et al., for the purpose of automatically adjusting the arc length and the rapid response time prevents any current overshoot.

17. Claims 37 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. in view of Kilty et al. (US Pat. 5,750,957).

18. Regarding claim 37 and 50, Takeshi et al. discloses all the claimed features except for the sampling conditions associated with the welding process for a purpose of obtaining information for identifying the determined event in real time. Kilty et al., however, teaches the sampling of the welding current and voltage signals and making determination of the weld quality based on information embedded in those signals (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Takeshi et al. to include the sampling conditions, as taught by Kilty et al., for the purpose of detecting the quality level of the weld.

19. Claims 38 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al in view of Kilty et al. (US Pat. 5,750,957) and further view of Fernicola (US Pat. 3,968,340).

20. Regarding claim 38 and 51, Takeshi et al. and Kilty et al. discloses all the claimed features except for the control unit is adapted to process information to obtain a first reference signal for regulating the rate of advancement of the consumable

electrode. Fernicola, however, teaches the used of the arc voltage as the feedback control variable to regulate the consumable electrode feed rate (Col. 1, Lines 2-8). This feedback control inherently teaches a first reference signal which is used as a variable feedback input signal to control the motor governor control 16 (Fig.) for adjusting the feed rate of the electrode. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the combined references to include the feedback signal to regulate the consumable electrode feed rate, as taught by Fernicola, for the purpose of controlling the melting rate of the welding process.

21. Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. in view of Kilty et al. (US Pat. 5,750,957) and further view of Renner (US Pat. 6,121,691).

22. Regarding claim 39, the combined references discloses all the claimed features including sampling condition associated with the welding process to obtain information for identifying the predetermined event in real time, except for processing the information to obtain a second reference signal for controlling the melt rate of the consumable electrode. Renner, however, teaches the voltage feedback 606 and 607 (Fig. 1) and current voltage 609 (Fig. 1) are fed back to the electronic field controller 104 (Fig. 1) to control the field current as to provide a desired output current and voltage to the weld (controlling the current and voltage is same as controlling the melting rate) (Col.5, Lines 9-17). The output of the electronic field controller is inherently teaches as a processing information to obtain a second reference signal for controlling the melt rate. Therefore, it would have been obvious to one of ordinary skill in the art at the time

of the invention was made to modify the combined references to include the feedback signals and the controller for controlling the field current as to provide a desired output current and voltage, as taught by Renner, for the purpose of providing a desired output current and voltage to the weld during the welding process.

23. Claims 40-41 and 53-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. in view of Madigan et al. (US Pat. 5,349,156).

24. Regarding claim 40-41 and 53-54, Takeshi et al. discloses all the claimed features except for the method of welding process and welding system uses a shielding gas which includes carbon dioxide. Madigan et al., however, teaches the use of shielding gas such as carbon dioxide to displace the atmosphere from the arc and the welding pool until solidification occurs, such that the molten metal does not react with the high oxygen and nitrogen levels in the atmosphere (Col. 1, Lines 29-37). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Takeshi et al. to include shielding gas such as carbon dioxide, as taught by Madigan et al., for the purpose of displacing the atmosphere from the arc and the welding pool until solidification occurs, such that the molten metal does not react with the high oxygen and nitrogen levels in the atmosphere.

25. Claims 42-43 and 55-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. in view of Suzuki et al. (US Pat. 6,031,203).

26. Regarding claim 42 and 55, Takeshi et al. discloses all the claimed features except for the welding system operates in a dip transfer mode wherein each welding cycle includes an arcing phase during which the consumable electrode is spaced from

the workpiece and an arc is generated across the space, the arc being operative to form a molten droplet on an end of the consumable electrode, and a short circuit phase during which the consumable electrode is in contact with said workpiece, each welding cycle changing from the arcing phase to the short circuit phase on contact of the molten droplet with the workpiece, and changing from the short circuit phase to the arcing phase after rupturing of a bridge of molten material formed between the consumable electrode and the workpiece.

Suzuki et al., however, teaches the short circuit or dip transfer mode for each welding cycle: an arcing phase during which the consumable electrode is spaced from the workpiece A (Fig. 4); and an arc is generated across the space, the arc being operative to form a molten droplet on an end of the consumable electrode B (Fig. 4), and a short circuit phase during which the consumable electrode is in contact with said workpiece C (Fig. 4), each welding cycle changing from the arcing phase to the short circuit phase on contact of the molten droplet with the workpiece H (Fig. 4), and changing from the short circuit phase to the arcing phase after rupturing of a bridge of molten material formed between the consumable electrode and the workpiece E (Fig. 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Takeshi et al. to include the short circuit or dip transfer mode, as taught by Suzuki et al, for the purpose of determining the welding stability between the base metal and the welding electrode thereby improving the welding process.

27. Regarding claim 43 and 56, Takeshi et al. discloses all the claimed features except for the welding system to form a molten droplet on the electrode end during the

arcing phase which has a diameter greater than the diameter of said consumable electrode, and causing the molten droplet to detach from the consumable electrode after the molten droplet has come into contact with the workpiece to thereby ensure a short circuit and arcing phase occurs in each welding cycle. Suzuki et al., however, - teaches the welding system to form a molten droplet on the electrode end during the arcing phase which has a diameter greater than the diameter of said consumable electrode A (Fig. 4), and causing the molten droplet to detach from the consumable electrode after the molten droplet has come into contact with the workpiece to thereby ensure a short circuit and arcing phase occurs in each welding cycle E (Fig. 4). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Takeshi et al. to include the welding system to form a molten droplet as claimed, as taught by Suzuki et al, for the purpose of determining the welding stability between the base metal and the welding electrode thereby improving the welding process.

28. Claim 52 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi et al. in view of Kilty et al. (US Pat. 5,750,957) and further view of Renner (US Pat. 6,121,691).

29. Regarding claim 52, the combined references discloses all the claimed features except for the control unit is adapted to process information to obtain a second reference signal for controlling the melt rate of the consumable electrode. Renner, however, teaches the voltage feedback 606 and 607 (Fig. 1) and current voltage 609 (Fig. 1) are fed back to the electronic field controller 104 (Fig. 1) to control the field

current as to provide a desired output current and voltage to the weld (controlling the current and voltage is same as controlling the melting rate) (Col.5, Lines 9-17). The output of the electronic field controller is inherently teaches as a processing information to obtain a second reference signal for controlling the melt rate. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the combined references to include the feedback signals and the controller for controlling the field current as to provide a desired output current and voltage, as taught by Renner, for the purpose of providing a desired output current and voltage to the weld during the welding process.

Conclusion

30. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ogasawara et al. (US pat. 4,546,234) discloses the output control of short circuit welding power source. Stava (US Pat. 5,001,326) discloses the apparatus and method of controlling a welding cycle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG NGUYEN whose telephone number is (571)270-7828. The examiner can normally be reached on Monday-Friday, 7:30AM-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quang Thanh can be reached on (571)272-4982. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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